Watershed Audit for the Town of Merrimack

Merrimack

Part 1. Watershed Planning

The application of regulatory measures and/or planning techniques that are designed to maintain or limit future impervious cover, redirect development where appropriate, and protect sensitive areas.

1.1 Does your community permit or encourage any of the following techniques to manage land use and impervious cover?

- [x] Conservation easements *(voluntary agreement to legal transfer of development and land use rights to a piece of property to a conservation trust; easements may be temporary or permanent)*
- [x] Land acquisition programs
- [ ] Transfer of development rights (TDRs) *(transfers potential development from a designated "sending area" to a designated "receiving area")*
- [ ] Limiting infrastructure extension *(a conscious decision is made to limit or deny extending infrastructure, such as public sewer, water, or roads, to designated areas to avoid increased development in these areas)*
- [ ] Infill / community redevelopment *(encourage new development and redevelopment within existing developed areas)*

Part 2. Land Conservation

Programs or efforts to conserve undeveloped, sensitive areas or areas of particular historical or cultural value.

2.1 Other than what is required by state and federal laws, is the preservation of cultural or historical areas (e.g., historic or archaeological sites, scenic views, and recreational areas):

- [ ] Required
- [x] Encouraged
- [ ] Neither
- [ ] Don't Know
- [ ] Other (please describe)_____

2.2 Is the preservation of agricultural areas:

- [ ] Required
- [ ] Encouraged
- [x] Neither
- [ ] Don't Know
- [ ] Other (please describe)_____

2.3 Are you aware of any critical habitat areas for plant and animal species in your community?

- [x] Yes
- [ ] No
- [ ] Don't Know

2.4 Other than what is required by state and federal laws, is the preservation of critical habitat areas for plant and animal species:

- [ ] Required
- [ ] Encouraged
- [ ] Neither
- [ ] Don't Know
- [ ] Other (please describe)_____

2.5 Does your community have regulations or requirements, other than what is required by state and federal laws, governing the preservation of wetlands during development?

- [x] Yes
- [ ] No
- [ ] Don't Know
- [ ] Other (please describe) 25- foot no disturb buffer (see exceptions) - drainage, et

2.6 Are there development restrictions pertaining to steep slopes?

- [x] Yes (cluster, PRD, & Soils-based Zoning)
- [ ] No
- [ ] Don't Know

2.7 Is the conservation of forested areas:

- [ ] Required
- [x] Encouraged
- [ ] Neither
- [ ] Don't Know
- [ ] Other (please describe)

2.8 Are there development restrictions pertaining to stream channel modification?

- [x] Yes (DES Regulations)
- [ ] No
- [ ] Don't Know

Part 3. Aquatic Buffers

The protection, restoration, creation, or reforestation of stream, wetland, and urban lake buffers.

3.1 Are stream buffers required in your community?

- [x] Yes
- [ ] No
- [ ] Don't Know

3.2 What are your stream buffer width requirements? - Get copy of exceptions

25- foot no cut buffer (see exceptions)
40 - foot building setback (Regular)
50 - foot building setback (Shoreland Protection)

3.3 Are wetland buffers required in your community?

- [x] Yes
- [ ] No
- [ ] Don't Know

3.4 What are your wetland buffer width requirements?

25 - foot no cut buffer

3.5 Are there reforestation, restoration, or riparian cover requirements or programs for buffers?

- [ ] Yes
- [x] No
- [ ] Don't Know

Part 4. Better Site Design

Local ordinances and codes incorporate techniques to reduce impervious cover and/or redirect runoff onto pervious surfaces in the design of new development and redevelopment projects.

4.1 What is the minimum pavement width allowed for streets in low-density residential developments that have less than 500 average daily trips (ADT)?

- ☐ 18 - 22 feet
- ☒ 23 - 26 feet
- ☐ Greater than 26 feet

4.2 What is the minimum right-of-way (ROW) width for a residential street?

- ☐ Less than 45 feet
- ☒ Greater than 45 feet (50 ft.)

4.3 What is the minimum radius allowed for cul-de-sacs?

- ☐ Less than 35 feet
- ☐ 36 feet to 45 feet
- ☒ Greater than 45 feet

4.4 Can a landscaped island be created within the cul-de-sac?

- ☒ Yes
- ☐ No
- ☐ Not specified in codes

4.5 Are curb and gutters required for most residential street sections?

- ☒ Yes
- ☐ No

4.6 What is the minimum parking ratio for a professional office building (per 1,000 ft2 of gross floor area)?

- ☐ Less than or equal to 3.0 spaces per 1,000 ft2 of gross floor area
- ☒ 3.1 to 5.0 spaces per 1,000 ft2 of gross floor area
- ☐ Greater than 5.0 spaces per 1,000 ft2 of gross floor area

4.7 What is the minimum required parking ratio for shopping centers (per 1,000 ft2 gross floor area)?

- ☐ Less than or equal to 4.0 spaces per 1,000 ft2 of gross floor area
- ☒ 4.1 to 5.5 spaces per 1,000 ft2 of gross floor area
- ☐ Greater than 5.5 spaces per 1,000 ft2 of gross floor area

4.8 What is the minimum required parking ratio for single-family homes (per home)?

- ☒ Less than or equal to 2.0 spaces (0)
- ☐ Greater than 2.0 spaces

4.9 Is the use of shared parking arrangements permitted?

- ☒ Yes
- ☐ No
- ☐ Not specified in codes

4.10 Are model shared parking agreements provided?
- ☐ Yes
- ☒ No
- ☐ Not applicable

4.11 Are parking ratios reduced if shared parking arrangements are in place?
- ☐ Yes
- ☐ No
- ☒ Not specified in codes (waiver) (cross easement)
- ☐ Not applicable

4.12 Is a percentage of the spaces at commercial parking lots required to have smaller dimensions for compact cars?
- ☐ Yes (please specify percentage)_____
- ☒ No

4.13 Can pervious materials be used for spillover parking areas?
- ☒ Yes
- ☐ No

4.14 Is a minimum percentage of a parking lot required to be landscaped?
- ☐ Yes
- ☒ No

4.15 Are open space or cluster development designs allowed in the community?
- ☒ Yes (R1 ?) — not allowed in R1
- ☐ No
- ☐ Not specified in codes

4.16 Are the submittal or review requirements for open space design greater than those for conventional development?
- ☐ Yes
- ☒ No (unless FRD) — look @ regs
- ☐ Not applicable

4.17 Are flexible site design criteria available for developers that utilize open space or cluster design options (e.g., setbacks, road widths, lot sizes)?
- ☒ Yes (clusters)
- ☐ No
- ☐ Not specified in codes
- ☐ Not applicable

4.18 Are sidewalks always required on both sides of residential streets?
- ☐ Yes
- ☒ No (Waiver) - look @ site plan/subdivision regs - Sidewalks are required - need a waiver to do one side

4.19 What is the minimum sidewalk width allowed in the community?
- ☐ 4 feet or less
- ☒ Greater than 4 feet (5-feet)
- ☐ Not specified in codes
- ☐ Not Applicable

4.20 Can alternate pedestrian networks be substituted for sidewalks (e.g., trails through common areas)?

- [x] Yes
- [ ] No
- [ ] Not specified in codes
- [ ] Not applicable

4.21 Can pervious materials be used for single-family home driveways (grass, gravel, porous pavers, etc)?

- [x] Yes (within the lot) - asphalt aprons - but driveways can be pervious
- [ ] No
- [ ] Not specified in codes

4.22 Can a "two-track" design be used at single-family driveways *(a driveway with two strips of paving corresponding to wheel tracks with a vegetated area in between)?*

- [x] Yes (within the lot)
- [ ] No
- [ ] Not specified in codes

4.23 Are shared driveways permitted in residential developments?

- [x] Yes Safety and reduce impact on wetlands
- [ ] No
- [ ] Not specified in codes

(Skip to question 4.27 if open space, cluster, or conservation developments are not allowed in your community.)

4.24 Are open space areas within subdivisions required to be consolidated into larger units?

- [ ] Yes
- [x] No
- [ ] Not specified in codes

4.25 Does a minimum percentage of open space in a residential subdivision have to be managed in a natural condition?

- [ ] Yes
- [x] No
- [ ] Not specified in codes

4.26 Are allowable and unallowable uses for open space in residential developments defined?

- [x] Yes
- [ ] No 10.8/10.9 references

4.27 Can rooftop runoff be discharged to yard areas?

- [ ] Yes
- [ ] No
- [x] Not specified in codes

Part 5. Erosion and Sediment Control

The use of erosion control, sediment controls and dewatering practices at all new development and redevelopment sites.

5.1 Does your community provide guidance or set forth requirements on the types of erosion and sediment control practices that may be used?

- ☒ Yes, we refer the development community to a state document
- ☐ Yes, we have developed our own guidance and/or requirements
- ☐ No
- ☐ Don't Know

5.2 Check all erosion and sediment control practices that your community has required to be implemented in the past three years:

- ☒ Silt fence
- ☒ Straw bales
- ☐ Construction sequencing
- ☒ Construction phasing
- ☒ Preservation and non-disturbance of natural vegetation
- ☒ Preservation and non-disturbance of stream or wetland buffers
- ☐ Stair-step grading
- ☒ Temporary seeding and mulching
- ☒ Permanent seeding and mulching
- ☒ Dust control
- ☒ Erosion blankets and geotextiles
- ☒ Fiber rolls
- ☒ Temporary stream crossings
- ☒ Stabilized construction entrance
- ☐ Exit tire wash
- ☒ Energy dissipation at pipe outlets
- ☒ Check dams in natural or man-made channels
- ☒ Sand / gravel bag barrier
- ☒ Brush or rock filter
- ☒ Storm drain inlet protection
- ☒ Catch basin inlet filters
- ☒ Sedimentation basins
- ☒ Sediment traps
- ☒ Filtration of dewatering operations (DES)
- ☒ Secondary filtration (mechanical or sand filtration devices to filter fine sediments from runoff) (Car washes)
- ☒ Dikes / berms as conveyance to ESC structures
- ☐ Pipe slope drains to bypass erodible soils
- ☒ Stockpile stabilization – out in the field

Some of these are implemented on site plan - others during construction.

5.3 Is an erosion and sediment control plan required during the site plan review process?

- ☒ Yes (general on the site plan)
- ☐ No
- ☐ Don't Know
- ☐ Not Applicable

5.4 Are construction sites inspected for compliance with erosion and sediment control requirements?

- [x] Yes
- [ ] No
- [ ] Don't Know

5.5 Who conducts inspections of construction sites for compliance with erosion and sediment control requirements?

- [ ] County / municipal inspector
- [ ] Third-party inspector (e.g. private engineer)
- [x] Other (please describe) ① Public Works – Road related engineering etc. ③ Developers Engineer ② Community Resources Planner – General Erosion Control

5.6 How frequently does an erosion and sediment control inspector visit a construction site?

- [ ] Daily
- [x] Weekly Special Cases for tough sites
- [ ] Monthly
- [ ] Annually
- [x] Other (please describe) Bi-weekly on average

5.7 Does your community sponsor erosion and sediment control training for:

- [ ] Developers
- [ ] Contractors
- [ ] Engineers
- [ ] Inspectors
- [x] None of the above

5.8 Are there erosion and sediment control enforcement mechanisms (e.g. fines, stop work orders, etc.)?

- [x] Yes
- [ ] No
- [ ] Don't Know

If yes, please describe enforcement mechanisms: – Hold Certificate of Occupancy (CO's)
– Hold road bond for compliance
Can use Cease and Desist – Stop Work Order

Part 6. Stormwater Management Practices

The incorporation of structural practices into new development, redevelopment, or the existing landscape to help mitigate the impacts of urbanization and stormwater runoff on receiving waters.

6.1 Is your community required to implement NPDES Phase II stormwater regulations?

- [x] Yes (In most of the Town) (encouraged everywhere)
- [ ] No
- [ ] Don't Know

6.2 If yes, what are the design criteria for stormwater practices?

- [x] Control peak discharge rate (flood control)
  Design storm(s): 25 and 50 year storm
- [x] Treat stormwater runoff for water quality
  Design storm(s): DES requirements for the 25 & 50 year storm
- [x] Control / reduce total volume of runoff (by means of infiltration practices, etc.)
  Design storm(s): No net gain in flow (25 & 50 year storm)
- [x] Protect downstream channels
  Design storm(s): DES recommends for the 25 & 50 year storm
- [ ] Other: _____

6.3 Does your community provide guidance or set forth requirements on the types of stormwater practices that may be constructed?

- [x] Yes, we refer the development community to a state document
- [ ] Yes, we have developed our own guidance and/or requirements
- [ ] No
- [ ] Don't Know

6.4 What are the top three stormwater practices typically installed in your community?

(1) Stormwater Management Reports & Recomendations
(2) Retain Water on site (Infiltration) with exceptions (Gas Stations)
(3) Discourage Sheet - Flow Natural Swale or wetland retention

6.5 Is a stormwater plan or other documentation required during the site plan review process?

- [x] Yes
- [ ] No
- [ ] Don't Know

6.6 Does your community inspect stormwater practices during construction?

- [x] Yes
- [ ] No
- [ ] Don't Know

6.7 Who is typically responsible for maintenance of stormwater practices over the life of the stormwater practice?

- [ ] Private owner
- [ ] Builder
- [ ] Homeowner's association
- [ ] Permitting agency
- [x] Other (please explain) The Town after the road & drainage for the road is accepted (Residential Only)
- [ ] Don't Know

6.8 Are privately maintained stormwater practices inspected by a public agency for maintenance upkeep or structural integrity over the life of the facility?

- [x] Yes DPW is looking into for non-point runoff
- [ ] No
- [ ] Don't Know

6.9 How frequently are privately-owned stormwater practices inspected?
- [x] More than once a year (6 months is a common request)
- [ ] Once a year
- [ ] Every two years
- [ ] In response to complaints
- [ ] Never
- [ ] Other (please describe)_____
- [ ] Don't Know

6.10 Are there penalties for not complying with the maintenance agreement or other applicable regulations applying to maintenance?
- [x] Yes
- [ ] No
- [ ] Don't Know

If yes, please describe penalties: $32,000 a day Courtesy of EPA.

Part 7. Non-Stormwater Discharges
Locating, quantifying, and controlling non-stormwater pollutant sources in the watershed. Operation and maintenance practices that prevent or reduce pollutants entering the municipal or natural drainage system.

7.1 The best description of my community's stormwater management system is:
- [x] Storm sewers (usually pipes leading to a receiving stream)
- [x] Open channels
- [x] Combination (please provide relative percentage of each) ≥ of the two
- [ ] Other (please describe)_____
- [ ] Don't Know

7.2 How does your community manage sanitary wastes (check all that apply)?
- [x] Septic systems
- [ ] Aeration systems
- [ ] Package treatment plants
- [x] Centralized wastewater treatment plants
- [ ] Other (please describe)_____
- [ ] Don't Know

7.3 Do the sanitary sewer trunk mains follow (check all that apply):
- [x] Shortest distance as grades allow
- [x] Stream valley
- [ ] Other (please describe)_____
- [ ] Don't Know
- [ ] Not Applicable

7.4 Does your community have regulations pertaining to septic system maintenance?
- ☐ Yes
- ☒ No
- ☐ Don't Know

7.5 Does your community conduct inspections of privately owned septic systems?
- ☒ Yes (only during construction)
- ☐ No
- ☐ Don't Know

7.6 Does your community have a spill response plan?
- ☒ Yes (Fire Department emergency response) - Hazard Mitigation Plan Emergency Mngt Plan
- ☐ No
- ☐ Don't Know

7.7 What deicing compounds are applied to public roads?
- ☒ Sand
- ☒ Road salt (Sodium Chloride, NaCl)
- ☒ Calcium Chloride (CaCl2) (liquid)
- ☐ Magnesium Chloride (MgCl2)
- ☐ Other (please describe)_____

7.8 How are the deicing compounds stored?
- ☒ Within structure
- ☐ Covered, but not in structure
- ☐ Not covered
- ☐ Other (please explain)_____

Part 8. Watershed Stewardship Programs
Stormwater and watershed education or outreach programs targeted towards fostering human behavior that prevents or reduces pollution over a range of land uses and activities.

8.1 Does your community administer or support watershed or pollution education or outreach programs targeted towards:
- ☒ Residents
- ☒ Commercial sector (MVD educational programs)
- ☒ Industrial sector
- ☒ Municipal employees 4th grade classes - importance of groundwater
- ☐ Other (please describe)_____
- ☐ None of the above

8.2 Are there any stream restoration programs or projects within your community?
- ☐ Yes
- ☒ No
- ☐ Don't Know

Use Manchester as an example

8.3 Does your community have any restrictions on pet waste management?
- ☐ Yes
- ☒ No
- ☐ Don't Know

If yes, please describe regulations or restrictions: _____

8.4 Does your community sweep public streets?
- ☒ Yes
- ☐ No
- ☐ Don't Know

8.5 How often does street sweeping occur?
- ☐ Weekly
- ☐ Monthly
- ☒ Annually
- ☒ Other (please explain) As required where needed

8.6 Does street sweeping vary seasonally (e.g., streets are not swept in winter)?
- ☒ Yes (please explain) Working on Winter early spring sand control testing sand ~~now~~ too.
- ☐ No
- ☐ Don't Know

8.7 Are fertilizers used on public lands?
- ☒ Yes
- ☐ No
- ☐ Don't Know

8.8 Are pesticides (insecticides, herbicides) used on public lands?
- ☒ Yes
- ☐ No
- ☐ Don't Know

Activity I
Conducting A Watershed Protection Audit

Objective

The objective of this activity is to provide trainees with the information necessary to conduct an audit of the watershed protection tools currently available in their watershed. This activity provides trainees with a program review sheet that they can mail out to communities that are located within their watershed.

Background

The first step in crafting a watershed plan is to establish a watershed baseline. One of the most important tasks in establishing a watershed baseline is to conduct an audit of local watershed protection capabilities. The purpose of the audit is to establish a baseline of current strategies and practices within the watershed. By understanding the current state of development, strategies and practices, strengths and weaknesses can be assessed and future efforts planned. For more information see the section, "Eight Tools of Watershed Protection."

This is a good community based activity because conducting a watershed audit is well within the ability of a watershed organization.

Time

The audit should be sent to each of the communities located in the watershed. After the audit has been sent out, trainees will need to allow communities around 4 weeks to complete the audit. Once the communities have the audit, they can expect to spend approximately 2 minutes on each page in the audit. After the audit has been returned, trainees should plan to spend 2 to 8 hours per community reviewing and compiling the results.

Materials

If trainees wish to conduct a watershed protection audit, they will need to gather the following material:

- List of communities within watershed boundaries
- Sample Audit Introduction to communities
- Watershed Protection Audit Sheet

Tips

This audit is focused on identifying watershed programs that the local government administers. Very often, regional, state, or federal regulations and initiatives may be applicable to your watershed. Once you have received the audits back from the local governments, review these and look for references to regional, state, or federal programs. If these are present, ask your local government contact for the appropriate person to contact to learn more about these programs.

INTRODUCTION TO WATERSHED PROTECTION AUDIT

Development has a profound influence on our streams, lakes and wetlands. Research conducted by a wide range of scientists has conclusively demonstrated the link between urbanization and receiving water body health. These impacts of **urbanization** come from many sources, including alterations to natural hydrology, influxes of pollutants during both wet and dry weather, modifications to natural vegetation, and increased impervious cover. Based on these causes and sources of impacts, watershed practitioners have recognized the need to apply a wide array of techniques to help maintain or restore water body health. These techniques are referenced as the "Tools of Watershed Protection."

The practice of watershed protection is about making choices about what tools to apply, and in what combination. The eight watershed protection tools roughly correspond to the stages of the development cycle from initial land use planning, site design, and construction through home ownership (Table 3.3). As a result, a watershed manager will generally need to apply some form of all eight tools in every watershed to provide comprehensive watershed protection. The tools, however, are applied in a different way depending on the type and quality of the receiving water, as well as the level of development currently existing within the watershed.

Table 3.3 The Eight Tools of Watershed Protection

Watershed Protection Tool	Description
1. Watershed Planning	The application of regulatory measures and/or planning techniques that are designed to maintain or limit future impervious cover, redirect development where appropriate, and protect sensitive areas.
2. Land Conservation	Programs or efforts to conserve undeveloped, sensitive areas or areas of particular historical or cultural value.
3. Aquatic Buffers	The protection, restoration, creation, or reforestation of stream, wetland, and urban lake buffers.
4. Better Site Design	Local ordinances and codes incorporate techniques to reduce impervious cover and/or redirect runoff onto pervious surfaces in the design of new development and redevelopment projects.
5. Erosion and Sediment Control	The use of erosion control, sediment control, and dewatering practices at all new development and redevelopment sites.
6. Stormwater Management	The incorporation of structural practices into new development, redevelopment, or the existing landscape to help mitigate the impacts of stormwater runoff on receiving waters.
7. Non-Stormwater Discharges	Locating, quantifying, and controlling non-stormwater pollutant sources in the watershed. Operation and maintenance practices that prevent or reduce pollutants entering the municipal or natural drainage system.
8. Watershed Stewardship Programs	Stormwater and watershed education or outreach programs targeted towards fostering human behavior that prevents or reduces pollution over a range of land uses and activities.

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